

## BRIEFER ARTICLES.

### NOTES OF TRAVEL. II.

#### PAYTA AND THE DESERT REGION OF PERU.

WHEN Mr. Barbour Lathrop, with whom the writer is traveling as botanical assistant, first decided to go *via* Panama to the west coast of South America, he remarked that he would show him Payta, the driest, most forsaken spot in the world. He would defy even a botanist to find so much as a single living wild plant. The donkeys of Payta are reputed, like the locusts during early days in Kansas, to eat any green plant in sight.

Payta lies less than five degrees south of the equator in the dry zone of Peru, on a coast, steadily rising from the sea in some parts, which has risen as much as forty feet within historic times. So infrequent are the rains on this coast that, when they do come, the whole native population, with crucifixes and musical instruments, goes out to welcome the river as it slowly forces its way along the bed which for seven years has been as dry as the surrounding desert. This coming of the river indicates heavy rains on the west slope of the Andes and is generally followed by showers in the region about Payta.

When we left Panama it was rumored there had been rain at Payta. Somewhat to Mr. Lathrop's disappointment, these rumors were verified when we anchored off the coast, and with the glasses discovered in one of the small valleys a green algaroba shrub (*Prosopis*). By looking closely we saw an almost imperceptible film of green spread over the tops of the light brownish-gray hills. On landing, we discovered that until February 9, when it rained from 10:00 P. M. until the following noon, no rain had fallen for eight years. The seventh year had failed to bring the usual periodic rains and the people were greatly alarmed lest another seven years should pass without water for the cotton crop upon which they depend largely for their support. The Piura river bed and a strip of land on each side which is overflowed from, after the subsidence of the stream, which runs only a month or two, the cultivated land of the country back of Payta. The long



rooted Peruvian cotton is able to maintain itself for seven years in this dried-out river bed and yields profitable crops of the colored, short staple cotton, which is used as an adulterant for wool, occupying a place in the wool rather than the cotton market. A stroll to the top of the nearest hill at Payta showed plainly that the rain had been a heavy one, for, scattered over the nearly level table land were the hard baked remains of unmistakable mud puddles. In these, strange as it



FIG. 1.— Photograph of garden at Mollendo, produced by irrigation.

seemed to us, no plants were found, although scattered over the sand and gravel all about were young seedlings and even blooming grasses.

The flora of Payta would not be a difficult one to write up exhaustively, provided one were on the spot at the right time. In a small pamphlet we were able to press all the phanerogamous plants which were found, without any difficulty. These plants comprise annuals whose seeds must have remained dormant since the last rain, eight years before, and perennials which have kept alive by encasing their



tissues in thick layers of impermeable cork. There is something remarkable in the ability which these desert shrubs have of reducing their transpiration surface to such a degree that they can withstand the intense insolation of this tropical region, and the even more trying influence of an extremely dry atmosphere. It is highly probable that they are able, during the winter season, to absorb moisture from the fogs which are blown in from the ocean. Owing to the cool currents



FIG. 2.—Photograph taken just outside of garden fence, showing the completely barren desert.

of air which blow summer and winter across these deserts, they are not exposed to such temperatures as would be expected in this latitude.

The collection of plants—the provisional flora of Payta—consists of two perennials, a *Prosopis* and an undetermined shrub, and seven annuals, three grasses, a lupine, a caryophyll, a seedling amaranth, and a beautiful yellow flowered oxalis. Our visit to Payta was twenty-two days after the rain, and the grasses and oxalis were in full bloom. The sight of hundreds of delicate yellow blossoms scattered over the perfectly barren hillsides, and slender blades of grass so far apart that



they looked like a very "bad catch" at lawn seeding, is one which few who have not been in the deserts in spring can imagine. Unlike the desert regions of our own country, with their sage brush, yuccas, and host of small tufts of grass and sedge, these deserts are for miles absolutely without a living plant. For days we steamed down the coast, but aside from an occasional garden made by irrigation in the neighborhood of the towns, we saw no green plant of any description. From about Payta in Peru, to Carrizal in Chili, representing fourteen days of steamer travel, the coast presents one unbroken line of desert. At Arica it is broken by a small fertile valley, and at Carrizal the desert ends in a scanty vegetation of cacti and low growing cushion-like perennials.

At Mollendo we had an opportunity to see what this desert might have been had there been an abundance of rain. The two photographs are taken within a hundred meters of each other. One shows a private garden in Mollendo with apples, peaches, grapes, passion fruits, figs; in short a good collection of fruit and shade trees. The other is a representative view of the surrounding country as barren as a fresh lava bed.

There are below this desert at Arica, and doubtless at other points, underground sources of water, for large pepper trees which have been planted in the town square are growing as finely as they do in Gibraltar, or southern California, and overshadowing the little clubhouse at Arica is one of the largest fig trees I have ever seen.

There is no place in the world under the tropics which possesses such a cool agreeable climate as this "zona sicca," or dry zone of western South America. The contrast between the west and the east coasts of the continent at the same latitude is very remarkable. At 5° S. off Brazil, duck suits are necessary for comfort, while at the same latitude off Peru thin flannels are quite comfortable.

For a systematic botanist, as may be judged from the above description, there is not much of interest in this region, but from a physiological point of view it will yield some very interesting facts.

Dr. Schimper, in his *Pflanzengeographie* p. 679, calls attention to the fact that this desert region of Peru has been very little studied from an ecological standpoint. It is probable that a very small number of species will be found along this coast, and hundreds of square miles are absolutely without a living plant for years at a time. Certain localities, however, favored by the fogs, are covered in the winter



season (our summer) by grasses in sufficient quantities to support numerous small herds of cattle.

The most favorable point from which to begin an ecological study of this desert region would be Payta and the inland town Piura behind it, which can be reached by railway. Having made arrangements at Piura for mules and a guide, the towns of Pacasmayo and Salaverry would not be too far apart to serve as centers for operation down the coast. The discomforts of travel through this desert, I understand, are not such as should deter any enterprising botanist from exploring it. The expenses, including steamboat travel for which the charges are twenty pounds sterling from Panama to Callao, would be easily within five dollars a day.—DAVID G. FAIRCHILD.

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#### SECTION G (BOTANY), A. A. A. S., COLUMBUS MEETING.

THE meeting of section G began on Monday, August 21, in Townshend Hall of the Ohio State University, by a brief session for organization. In the afternoon at four o'clock, in Botanical Hall, the vice president, DR. CHARLES REID BARNES, delivered an address on *The progress and problems of plant physiology*. At the close of the address, the thanks of the section were voted to the speaker.

The reading of papers began on Tuesday, when the following were presented in full, or in abstract, or by title:

- F. L. STEVENS: The fertilization of *Albugo bliti*.  
 FRANCIS RAMALEY: The embryo sac of *Leucocrinum montanum*.  
 A. S. HITCHCOCK: Notes on subterranean organs.  
 W. J. BEAL: Some monstrosities in spikelets of *Eragostis* and *Setaria*, with their meaning.  
 CHARLES E. BESSEY: Studies of vegetation of the high Nebraska plains.  
 A. D. SELBY: The tamarack swamp in Ohio.  
 WM. SAUNDERS: The breeding of apples for the northwest plains.  
 BYRON D. HALSTED: Field experiments with "nitragin" and other germ fertilizers.  
 HENRY L. BOLLEY: The duration of bacterial existence under trial environments.

Wednesday was designated *Sullivant Day*, and was used to commemorate Wm. S. Sullivant (died 1873) and Leo Lesquereux (died 1888), two most able bryologists who were long residents of Columbus. Through the initiative and energy of Mrs. E. G. Britton and the